```
=> FILE REG
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STRUCTURE FILE UPDATES:   26 JUN 2007  HIGHEST RN 939408-72-7
DICTIONARY FILE UPDATES:  26 JUN 2007  HIGHEST RN 939408-72-7

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=> FILE HCAPL
FILE 'HCAPLUS' ENTERED AT 10:39:02 ON 27 JUN 2007
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FILE COVERS 1907 - 27 Jun 2007  VOL 147 ISS 1
FILE LAST UPDATED: 26 Jun 2007  (20070626/ED)

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 This file contains CAS Registry Numbers for easy and accurate
 substance identification.

=> D QUE L33
L10             STR
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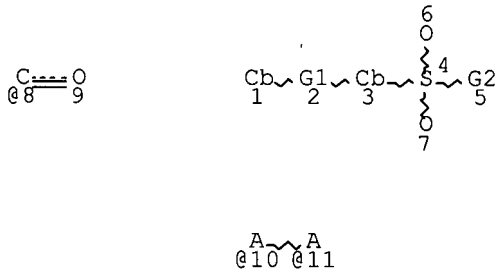

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VAR G2=O/X
NODE ATTRIBUTES:
CONNECT IS E1 RC AT 9
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 1
GGCAT IS UNS AT 3
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 11

STEREO ATTRIBUTES: NONE

L12	109354	SEA FILE=REGISTRY SSS FUL L10
L14	2706	SEA FILE=REGISTRY ABB=ON L12 AND PMS/CI
L15	106648	SEA FILE=REGISTRY ABB=ON L12 NOT L14
L16	1	SEA FILE=REGISTRY ABB=ON CARBON/CN
L17	40642	SEA FILE=HCAPLUS ABB=ON (L16 OR CARBON OR C)(5A)PARTICLE#
L18	1619	SEA FILE=HCAPLUS ABB=ON L14
L19	922	SEA FILE=HCAPLUS ABB=ON L18(L)PREP/RL
L20	7	SEA FILE=HCAPLUS ABB=ON L17 AND L19
L21	8	SEA FILE=HCAPLUS ABB=ON L17 AND L18
L22	67737	SEA FILE=HCAPLUS ABB=ON L15
L23	61	SEA FILE=HCAPLUS ABB=ON L22(L)POLYMER?(L)ELECTROLYT?
L24	143965	SEA FILE=HCAPLUS ABB=ON (L16 OR CARBON OR C)(5A)(CAT/RL OR CATALYST? OR SUPPORT? OR ELECTRODE?)
L25	42	SEA FILE=HCAPLUS ABB=ON L18 AND L24
L26	5	SEA FILE=HCAPLUS ABB=ON L23 AND L25
L27	9	SEA FILE=HCAPLUS ABB=ON L23 AND (L17 OR L24)
L28	14	SEA FILE=HCAPLUS ABB=ON L20 OR L21 OR L26 OR L27
L29	40	SEA FILE=HCAPLUS ABB=ON L25 AND FUEL(2A)CELL#
L30	44	SEA FILE=HCAPLUS ABB=ON L29 OR L28
L31	3	SEA FILE=HCAPLUS ABB=ON L30 AND BINDER?
L32	44	SEA FILE=HCAPLUS ABB=ON L30 OR L31
L33	7	SEA FILE=HCAPLUS ABB=ON L32 AND (1840-2003)/PRY,AY,PY

=> D L33 BIB ABS IND HITSTR 1-7

L33 ANSWER 1 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
AN 2005:253340 HCAPLUS Full-text
DN 142:319817
TI Membrane-electrode structure for solid polymer **fuel cell**
IN Otsuki, Toshihiro; Goto, Kohei; Takahashi, Ryoichiro; Asano, Yoichi
PA Honda Motor Co., Ltd., Japan; JSR Corporation
SO Eur. Pat. Appl., 25 pp.

CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1517390	A2	20050323	EP 2004-22083	20040916 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR				
	JP 2005116517	A	20050428	JP 2004-262700	20040909 <--
	US 2005064260	A1	20050324	US 2004-941899	20040916 <--
	CA 2482061	A1	20050319	CA 2004-2482061	20040917 <--
PRAI	JP 2003-328310	A	20030919 <--		

AB Disclosed is a membrane-electrode structure for a solid polymer **fuel cell** comprising a pair of electrode catalyst layers and a polyelectrolyte membrane sandwiched between the electrode catalyst layers, wherein the electrode catalyst layers contain polyarylene having a sulfonic acid group.

IC ICM H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST membrane electrode structure solid polymer **fuel cell** sulfonated polyarylene
IT Catalysts
(electrocatalysts; membrane-electrode structure for solid polymer **fuel cell**)
IT **Fuel cell** electrodes
Fuel cell electrolytes
Fuel cells
(membrane-electrode structure for solid polymer **fuel cell**)
IT **Carbon** black, uses
Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(membrane-**electrode** structure for solid polymer **fuel cell**)
IT Polymer electrolytes
(membrane; membrane-electrode structure for solid polymer **fuel cell**)
IT Sulfonic acids, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(polymers, arylene; membrane-electrode structure for solid polymer **fuel cell**)
IT Polymers, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(sulfo-containing, arylene; membrane-electrode structure for solid polymer **fuel cell**)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(membrane-electrode structure for solid polymer **fuel cell**)
IT 463963-71-5P **663920-28-3P**
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(membrane-electrode structure for solid polymer **fuel cell**)
IT 9002-84-0, Ptfe
RL: MOA (Modifier or additive use); USES (Uses)
(membrane-electrode structure for solid polymer **fuel cell**)
IT 122325-09-1P

RL: SPN (Synthetic preparation); PREP (Preparation)
(membrane-electrode structure for solid polymer **fuel cell**)

IT **663920-28-3P**
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(membrane-electrode structure for solid polymer **fuel cell**)

RN 663920-28-3 HCAPLUS

CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 2,2-dimethylpropyl ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

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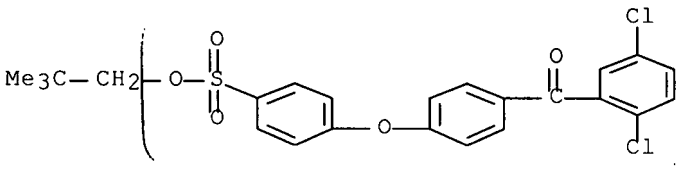
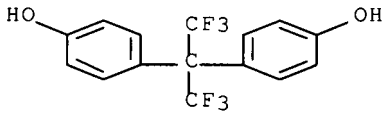
CRN 663920-26-1
CMF C24 H22 Cl2 O5 S



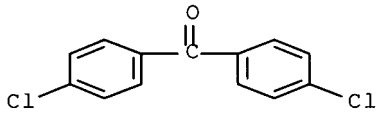
CM 2

CRN 1478-61-1
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2
CMF C13 H8 Cl2 O



L33 ANSWER 2 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:878628 HCAPLUS Full-text

DN 141:368416
TI **Fuel cell** and method for producing same
IN Obata, Takeshi; Nakamura, Shin; Yoshitake, Tsutomu; Kubo, Yoshimi; Omi, Takehiko; Tamai, Shoji; Kuroki, Takashi; Ikado, Shuhei
PA NEC Corporation, Japan; Mitsui Chemicals Inc.
SO PCT Int. Appl., 44 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004091027	A1	20041021	WO 2004-JP4125	20040324 <--
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	CA 2522017	A1	20041021	CA 2004-2522017	20040324 <--
	EP 1624513	A1	20060208	EP 2004-723078	20040324 <--
	R: DE, GB				
	CN 1799160	A	20060705	CN 2004-80015238	20040324 <--
	TW 242306	B	20051021	TW 2004-93109592	20040407 <--
	US 2006251951	A1	20061109	US 2006-552712	20060707 <--
PRAI	JP 2003-105626	A	20030409	<--	
	WO 2004-JP4125	W	20040324		

AB An intermediate layer is formed between a catalyst layer and a solid polymer electrolyte membrane. The intermediate layer contains a protonic acid group-containing aromatic polyether ketone and catalyst particles.
IC ICM H01M008-02
ICS H01M008-10; H01M004-86
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **fuel cell** ion conductive polymer membrane polyamide electrolyte; polysulfone protonic acid contg ionic conductor
IT **Carbon** black, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst support; fuel cell** and method for producing same)
IT **Fuel cell** electrolytes
(**fuel cell** and method for producing same)
IT Fluoropolymers, uses
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**fuel cell** and method for producing same)
IT Polyketones
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polyether-, ion-conductive membrane electrolyte; **fuel cell** and method for producing same)
IT Polyethers, uses
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES

(Uses)
(polyketone-, ion-conductive membrane electrolyte; **fuel cell** and method for producing same)

IT Ionic conductors
(polymeric; **fuel cell** and method for producing same)

IT Polyoxyphenylenes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(sulfonated, crosslinked; **fuel cell** and method for producing same)

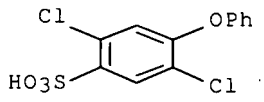
IT 24937-79-9 25667-42-9 124447-51-4 124564-98-3 124564-99-4
466696-81-1 466696-82-2 466696-83-3
493354-51-1 494211-07-3 **610322-39-9 610322-40-2**
610322-41-3 610322-45-7 **610322-48-0**
610322-50-4 610322-51-5 610322-52-6
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**fuel cell** and method for producing same)

IT **466696-81-1 466696-82-2 466696-83-3**
610322-39-9 610322-40-2 610322-41-3
610322-48-0 610322-50-4 610322-51-5
610322-52-6
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**fuel cell** and method for producing same)

RN 466696-81-1 HCAPLUS
CN Benzenesulfonic acid, 2,5-dichloro-4-phenoxy-, polymer with dichlorobenzene (9CI) (CA INDEX NAME)

CM 1

CRN 466696-80-0
CMF C12 H8 Cl2 O4 S



CM 2

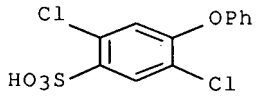
CRN 25321-22-6
CMF C6 H4 Cl2
CCI IDS

2 (D1—Cl)

RN 466696-82-2 HCAPLUS
CN Benzenesulfonic acid, 2,5-dichloro-4-phenoxy-, polymer with (3,4-dichlorophenyl)phenylmethanone (9CI) (CA INDEX NAME)

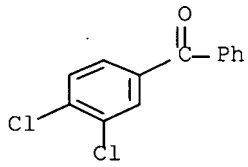
CM 1

CRN 466696-80-0
CMF C12 H8 Cl2 O4 S



CM 2

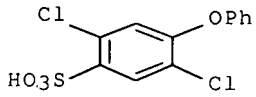
CRN 6284-79-3
CMF C13 H8 Cl2 O



RN 466696-83-3 HCAPLUS
CN Benzenesulfonic acid, 2,5-dichloro-4-phenoxy-, polymer with bis(4-chlorophenyl)methanone (9CI) (CA INDEX NAME)

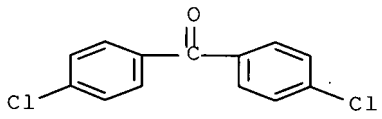
CM 1

CRN 466696-80-0
CMF C12 H8 Cl2 O4 S



CM 2

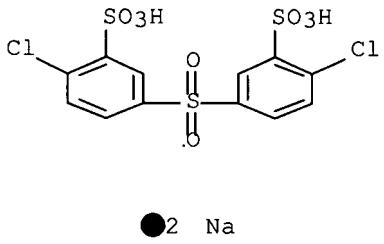
CRN 90-98-2
CMF C13 H8 Cl2 O



RN 610322-39-9 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, disodium salt, polymer with 3-ethenylphenol, 4,4'-(1-methylethylidene)bis[phenol] and 1,1'-sulfonylbis[4-chlorobenzene] (9CI) (CA INDEX NAME)

CM 1

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



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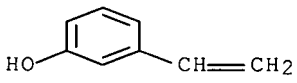
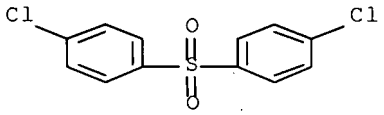
CRN 620-18-8
CMF C8 H8 O



CM 3

CRN 80-07-9
CMF C12 H8 Cl2 O2 S



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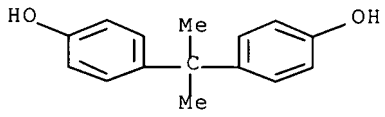
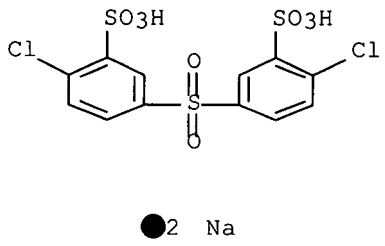
CRN 80-05-7
CMF C15 H16 O2



RN 610322-40-2 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, disodium salt, polymer with 3-ethenylphenol, 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)

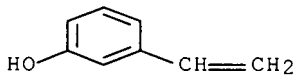
CM 1

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



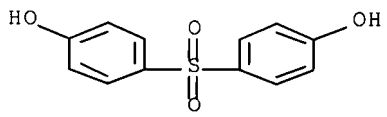
CM 2

CRN 620-18-8
CMF C8 H8 O



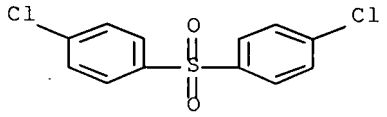
CM 3

CRN 80-09-1
CMF C12 H10 O4 S



CM 4

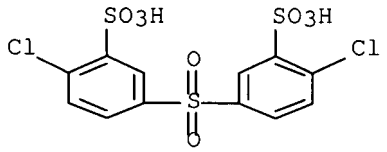
CRN 80-07-9
CMF C12 H8 Cl2 O2 S

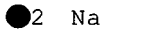


RN 610322-41-3 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, disodium salt, polymer with 1,4-benzenediol, 3-ethenylphenol and 1,1'-sulfonylbis[4-chlorobenzene] (9CI) (CA INDEX NAME)

CM 1

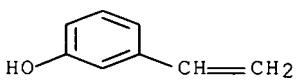
CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na





CM 2

CRN 620-18-8
CMF C8 H8 O



CM 3

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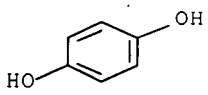
CMF C6 H6 O2



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CRN 80-07-9
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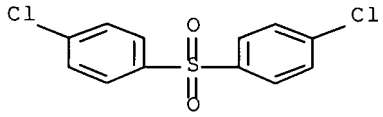
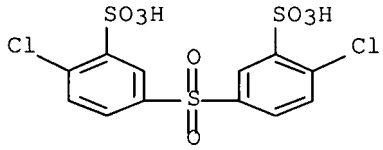


RN 610322-48-0 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, disodium salt, polymer with 1-ethenyl-4-fluorobenzene, 4,4'-(1-methylethylidene)bis[phenol] and 1,1'-sulfonylbis[4-chlorobenzene] (9CI) (CA INDEX NAME)

CM 1

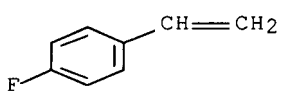
CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



2 Na

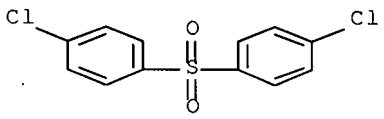
CM 2

CRN 405-99-2
CMF C8 H7 F



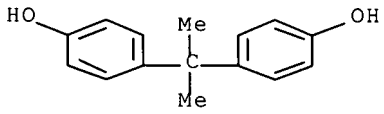
CM 3

CRN 80-07-9
CMF C12 H8 Cl2 O2 S



CM 4

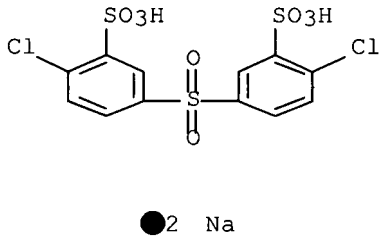
CRN 80-05-7
CMF C15 H16 O2



RN 610322-50-4 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, disodium salt, polymer with 1-ethenyl-4-(trifluoromethyl)benzene, 4,4'-(1-methylethylidene)bis[phenol] and 1,1'-sulfonylbis[4-chlorobenzene] (9CI) (CA INDEX NAME)

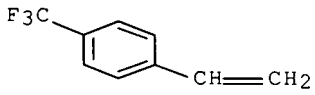
CM 1

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



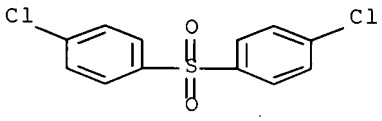
CM 2

CRN 402-50-6
CMF C9 H7 F3



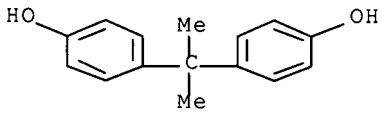
CM 3

CRN 80-07-9
CMF C12 H8 Cl2 O2 S



CM 4

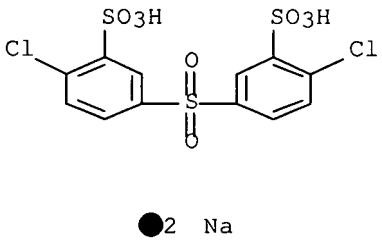
CRN 80-05-7
CMF C15 H16 O2



RN 610322-51-5 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, disodium salt, polymer with 1,1'-(1,2-ethenediyl)bis[4-fluorobenzene], 4,4'-(1-methylethylidene)bis[phenol] and 1,1'-sulfonylbis[4-chlorobenzene] (9CI) (CA INDEX NAME)

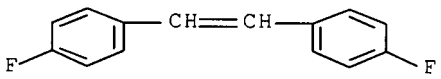
CM 1

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



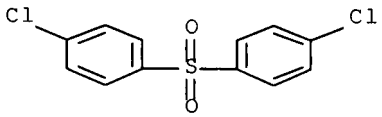
CM 2

CRN 588-56-7
CMF C14 H10 F2



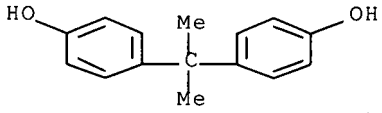
CM 3

CRN 80-07-9
CMF C12 H8 Cl2 O2 S



CM 4

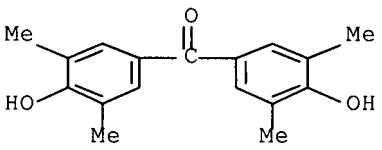
CRN 80-05-7
CMF C15 H16 O2



RN 610322-52-6 HCAPLUS
CN Benzenesulfonic acid, 3,3'-sulfonylbis[6-chloro-, disodium salt, polymer with bis(4-hydroxy-3,5-dimethylphenyl)methanone (9CI) (CA INDEX NAME)

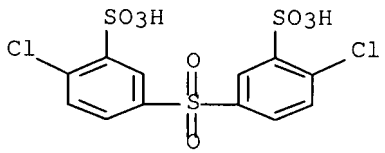
CM 1

CRN 92005-15-7
CMF C17 H18 O3



CM 2

CRN 51698-33-0
CMF C12 H8 Cl2 O8 S3 . 2 Na



●2 Na

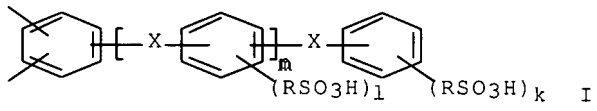
RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 3 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:632908 HCAPLUS Full-text
DN 141:176868
TI Polymer electrolyte, proton conductive membrane and membrane-electrode assembly
IN Otsuki, Toshihiro; Kanaoka, Nagayuki; Iguchi, Masaru; Mitsuta, Naoki; Soma, Hiroshi
PA Honda Motor Co., Ltd., Japan; JSR Corporation
SO U.S. Pat. Appl. Publ., 13 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 2004149965	A1	20040805	US 2004-768151	20040202 <--
US 7211203	B2	20070501		
JP 2004256797	A	20040916	JP 2004-15864	20040123 <--
EP 1450430	A2	20040825	EP 2004-2358	20040203 <--
EP 1450430	A3	20041124		

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

PRAI JP 2003-27268 A 20030204 <--
GI



I

AB Disclosed are a polymer electrolyte having improved hot water resistance and radical resistance, a proton conductive membrane comprising the polymer electrolyte, and a membrane-electrode assembly including the proton conductive membrane. The polymer electrolyte comprises ≥1 polymer selected from polyether, polyketone, polyetherketone, polysulfone, polyethersulfone, polyimide, polyetherimide, polybenzimidazole, polybenzothiazole,

polybenzoxazole and the like. The polymer comprises a repeating structural unit with either or both of an aromatic ring and a heterocyclic ring, and a repeating structural unit I, wherein X = a single bond, an electron-withdrawing group or an electron-donating group; R = a single bond, (CH2)q or (CF2)q; k = 0-5; l = 0-4 (k + l ≥1); and q , m = 0-10. Thus, 4,4'-dihydroxybiphenyl disodium salt 23.0, 4,4'-dichlorodiphenylsulfone 14.4, and 2,5-dichloro-4'-(4- phenoxyphenoxy)benzophenone 21.8 g were polymerized at 260° for 10 h and sulfonated to give an polyelectrolyte with acid equivalent 1.8 m-equivalent/g and proton conductivity 0.116 s/c, which was pressed between an oxygen electrode and a fuel electrode to give a membrane **electrode** assembly with **c**.d. 0.2 A/cm2.

IC ICM H01B001-00
INCL 252500000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST polymer electrolyte proton conductive membrane electrode assembly; sulfonated dihydroxybiphenyl disodium salt dichlorodiphenylsulfone dichlorophenoxyphenoxybenzophenone copolymer prepn
IT Polysulfones, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, sulfonated; preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)
IT Polyimides, uses
Polyketones
RL: TEM (Technical or engineered material use); USES (Uses)
(polyether-; preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)
IT Polyethers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyimide-; preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)
IT Polyethers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyketone-; preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)
IT Polyethers, uses
RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polysulfone-, sulfonated; preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)
IT **Fuel cells**
Membrane electrodes
Polymer electrolytes
(preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)
IT Polybenzimidazoles
Polybenzothiazoles
Polyethers, uses
Polyimides, uses
Polyketones
Polyoxadiazoles
Polyparabanic acids
Polyquinolines
Polyquinoxalines
Polysulfones, uses
Polythiophenylenes
RL: TEM (Technical or engineered material use); USES (Uses)

(preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)

IT Membranes, nonbiological
(proton conductive; preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)

IT Ionic conductors
(proton; preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)

IT Polybenzoxazoles
RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfonated; preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)

IT 733037-89-3DP, sulfonated **733037-91-7DP**, sulfonated
RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)

IT 25280-53-9, Polyhydantoin
RL: TEM (Technical or engineered material use); USES (Uses)
(preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)

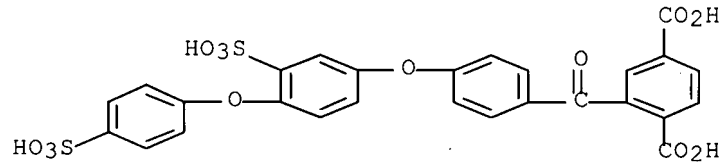
IT **733037-91-7DP**, sulfonated
RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(preparation of polymer electrolytes for proton conductive membranes and membrane-electrode assembly)

RN 733037-91-7 HCAPLUS

CN 1,4-Benzenedicarboxylic acid, 2-[4-[3-sulfo-4-(4-sulfophenoxy)phenoxy]benzoyl]-, disodium salt, polymer with 1,4-benzenedicarboxylic acid and 4,6-diamino-1,3-benzenediol dihydrochloride (9CI) (CA INDEX NAME)

CM 1

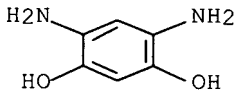
CRN 733037-90-6
CMF C27 H18 O13 S2 . 2 Na



●2 Na

CM 2

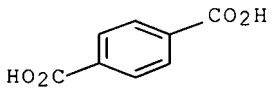
CRN 16523-31-2
CMF C6 H8 N2 O2 . 2 Cl H



●2 HCl

CM 3

CRN 100-21-0
CMF C8 H6 O4



L33 ANSWER 4 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:493501 HCAPLUS Full-text
DN 141:40719
TI Method for producing membrane-electrode structure for polymer electrolyte fuel cell
IN Tani, Masaki; Shinkai, Hiroshi; Kohyama, Katsuhiko; Tanaka, Ichiro; Hama, Yuichiro; Yano, Junichi
PA Honda Motor Co., Ltd., Japan
SO U.S. Pat. Appl. Publ., 23 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004115499	A1	20040617	US 2003-721505	20031126 <--
	JP 2004193109	A	20040708	JP 2003-371048	20031030 <--
	JP 2004221056	A	20040805	JP 2003-371049	20031030 <--
	JP 2004214173	A	20040729	JP 2003-371836	20031031 <--
PRAI	JP 2002-347580	A	20021129	<--	
	JP 2002-366037	A	20021218	<--	
	JP 2002-379820	A	20021227	<--	
	JP 2003-371048	A	20031030	<--	
	JP 2003-371049	A	20031030	<--	
	JP 2003-371836	A	20031031	<--	

AB The present invention provides a method for producing a membrane-electrode structure having an excellent adhesiveness between an electrode catalyst layer and a diffusion electrode, and a polymer electrolyte fuel cell using a membrane-electrode structure obtained by the production method. Moreover, it also provides an elec. apparatus and a transport machine that use the above polymer electrolyte fuel cell. A catalyst past comprising a catalyst supported by an electron conducting material and an ion conducting material is applied on a sheet substrate, and it is then dried, so as to form electrode catalyst layers. The electrode catalyst layers are thermally transferred onto

each side of a polymer electrolyte membrane, so as to form a laminated body. A first slurry comprising a water-repellent material and an electron conducting material is applied on a carbon substrate layer, and it is dried to form a water-repellent layer, and then, a second slurry comprising an electron conducting material and an ion conducting material is applied on the water-repellent layer, and it is dried to form a hydrophilic layer, so that a diffusion electrode is formed. The previously formed diffusion electrode is laminated on the electrode catalyst layer through the hydrophilic layer, and they are then pressed under heating, so as to integrate the laminated body and the diffusion electrode.

IC ICM H01M008-10
ICS H01M004-88; H01M004-96; B05D005-12
INCL 429030000; 427115000; 502101000; 429044000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST membrane electrode structure fabrication polymer electrolyte fuel cell
IT Catalysts
(electrocatalysts; method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT Electric apparatus
Fuel cell electrodes
Fuel cell electrolytes
(method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT Polyketones
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyarylene-polyether-, sulfonated; method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT Polysulfones, uses
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyarylene-polyether-; method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT Polyethers, uses
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyarylene-polyketone-, sulfonated; method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT Polyethers, uses
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyarylene-polysulfone-; method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT Polyphenyls
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyketone-, fluorine-containing; method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT Polyphenyls
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(polyketone-, sulfonated; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT Fluoropolymers, uses
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyketone-polyphenyl-; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT Fuel cells
(polymer electrolyte; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT Polyketones
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyphenyl-, fluorine-containing; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT Polyketones
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyphenyl-, sulfonated; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT Carbon fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(pore formers; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT **Carbon** black, uses
RL: CAT (Catalyst use); USES (Uses)
(**support**; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT Machinery
(transport; method for producing membrane-electrode structure for polymer electrolyte fuel cell)

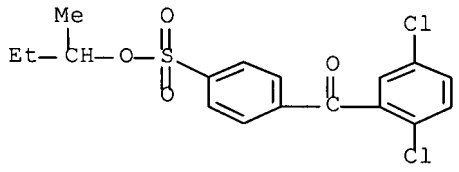
IT 7440-06-4, Platinum, uses 37258-14-3
RL: CAT (Catalyst use); USES (Uses)
(method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT 122325-09-1DP, reaction products with derivatized benzophenones, sulfonated 463954-50-9DP, reaction product with bisphenol AF and derivatized benzophenone oligomer, sulfonated **701909-66-2DP**, reaction product with bisphenol AF and derivatized benzophenone oligomer, sulfonated
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(method for producing membrane-electrode structure for **polymer electrolyte** fuel cell)

IT 9002-84-0, Ptfe
RL: MOA (Modifier or additive use); USES (Uses)
(method for producing membrane-electrode structure for polymer electrolyte fuel cell)

IT 122325-09-1P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(method for producing membrane-electrode structure for polymer

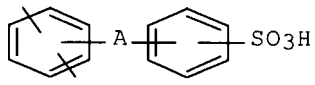
electrolyte fuel cell)
IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; method for producing membrane-electrode structure for polymer electrolyte fuel cell)
IT **701909-66-2DP**, reaction product with bisphenol AF and derivatized benzophenone oligomer, sulfonated
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(method for producing membrane-electrode structure for **polymer electrolyte** fuel cell)
RN 701909-66-2 HCAPLUS
CN Benzenesulfonic acid, 4-(2,5-dichlorobenzoyl)-, 1-methylpropyl ester (9CI) (CA INDEX NAME)



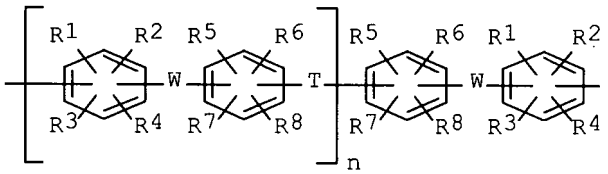
L33 ANSWER 5 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:402980 HCAPLUS Full-text
DN 140:409627
TI Electrode structure for polymer electrolyte **fuel cells**
IN Sohma, Hiroshi; Iguchi, Masaru; Kanaoka, Nagayuyki; Kaji, Hayato; Morikawa, Hiroshi; Mitsuta, Naoki
PA Honda Motor Co., Ltd., Japan
SO Eur. Pat. Appl., 26 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1420473	A1	20040519	EP 2003-26194	20031117 <--
	EP 1420473	B1	20060412		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	US 2004197632	A1	20041007	US 2003-714394	20031117 <--
	JP 2005158265	A	20050616	JP 2003-387362	20031118 <--
PRAI	JP 2002-333143	A	20021118 <--		
	JP 2003-371047	A	20031030 <--		

GI



I



II

AB The present invention provides an electrode structure for polymer electrolyte **fuel cells**, inexpensive, and exhibiting excellent power production capacity and durability even under high temperature/low humidity conditions, and also provides a polymer electrolyte **fuel cell** which incorporates the same electrode structure. The present invention also provides an elec. device and transportation device, each incorporating the same polymer electrolyte **fuel cell**. The electrode structure comprises a pair of electrode catalyst layers, each containing a **catalyst supported** by **carbon particles**, and polymer electrolyte membrane placed between these electrode catalyst layers. The polymer electrolyte membrane is of a sulfonated polyarylene composed of 0.5 to 100% by mol of the first repeating unit represented by (I) and 0 to 99.5% by mol of the second repeating unit represented by (II): (wherein, A is a divalent organic group; and a benzene ring includes its derivative; -W- is a divalent electron attracting group; - T- is a divalent organic group; and R1 to R8 are a hydrogen atom or fluorine atom, an alkyl group, fluorine-substituted alkyl group, allyl group, aryl group or cyano group, and may be the same or different).

IC ICM H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST electrode structure polymer electrolyte **fuel cell**

IT Catalysts
(electrocatalysts; electrode structure for polymer electrolyte **fuel cells**)

IT **Fuel cell** electrodes
(electrode structure for polymer electrolyte **fuel cells**)

IT Noble metals
RL: CAT (Catalyst use); USES (Uses)
(electrode structure for polymer electrolyte **fuel cells**)

IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(electrode structure for polymer electrolyte **fuel cells**)

IT Polyoxyalkylenes, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; electrode structure for polymer electrolyte **fuel cells**)

IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; electrode structure for polymer electrolyte **fuel cells**)

IT Ionomers

RL: MOA (Modifier or additive use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; electrode structure for polymer electrolyte **fuel cells**)

IT **Fuel cells**
(solid electrolyte; electrode structure for polymer electrolyte **fuel cells**)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(electrode structure for polymer electrolyte **fuel cells**)

IT **690247-89-3D**, ester hydrolysis products
RL: DEV (Device component use); USES (Uses)
(electrode structure for polymer electrolyte **fuel cells**)

IT 9002-84-0, Ptfe
RL: MOA (Modifier or additive use); USES (Uses)
(electrode structure for polymer electrolyte **fuel cells**)

IT 122325-09-1P **663920-23-8P**, Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt **663920-24-9P**, 4-[4-(2,5-Dichlorobenzoyl)phenoxy]benzenesulfonyl chloride **690247-88-2P 690247-89-3P**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(electrode structure for **polymer electrolyte fuel cells**)

IT **7440-44-0, Carbon**, uses
RL: CAT (Catalyst use); USES (Uses)
(**support; electrode** structure for polymer electrolyte **fuel cells**)

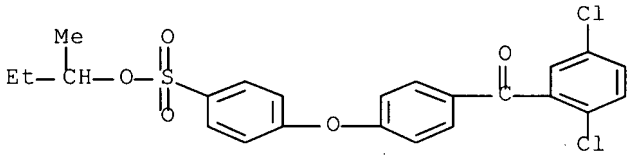
IT **690247-89-3D**, ester hydrolysis products
RL: DEV (Device component use); USES (Uses)
(electrode structure for polymer electrolyte **fuel cells**)

RN 690247-89-3 HCAPLUS

CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 1-methylpropyl ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol], block (9CI) (CA INDEX NAME)

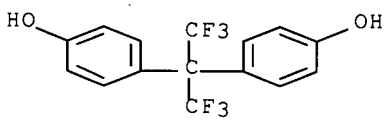
CM 1

CRN 690247-88-2
CMF C23 H20 Cl2 O5 S



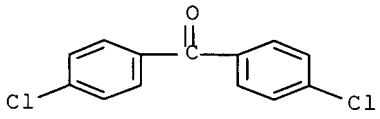
CM 2

CRN 1478-61-1
CMF C15 H10 F6 O2



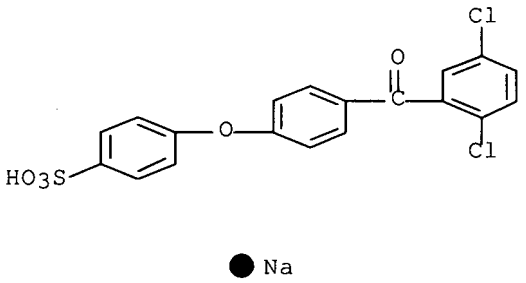
CM 3

CRN 90-98-2
CMF C13 H8 Cl2 O

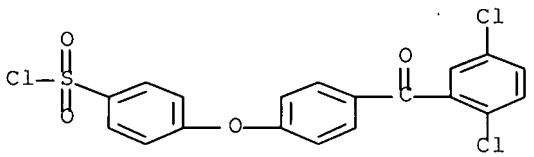


IT **663920-23-8P**, Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt **663920-24-9P**, 4-[4-(2,5-Dichlorobenzoyl)phenoxy]benzenesulfonyl chloride **690247-88-2P 690247-89-3P**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(electrode structure for **polymer electrolyte fuel cells**)

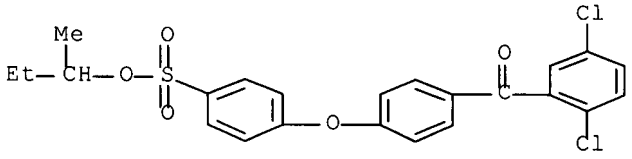
RN 663920-23-8 HCAPLUS
CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, sodium salt (9CI) (CA INDEX NAME)



RN 663920-24-9 HCAPLUS
CN Benzenesulfonyl chloride, 4-[4-(2,5-dichlorobenzoyl)phenoxy]- (9CI) (CA INDEX NAME)



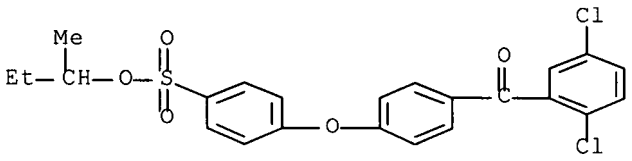
RN 690247-88-2 HCAPLUS
CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 1-methylpropyl ester (9CI) (CA INDEX NAME)



RN 690247-89-3 HCAPLUS
CN Benzenesulfonic acid, 4-[4-(2,5-dichlorobenzoyl)phenoxy]-, 1-methylpropyl ester, polymer with bis(4-chlorophenyl)methanone and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol], block (9CI) (CA INDEX NAME)

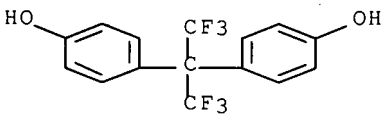
CM 1

CRN 690247-88-2
CMF C23 H20 Cl2 O5 S



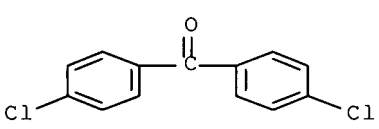
CM 2

CRN 1478-61-1
CMF C15 H10 F6 O2



CM 3

CRN 90-98-2
CMF C13 H8 Cl2 O



IT **7440-44-0, Carbon**, uses
RL: CAT (Catalyst use); USES (Uses)
(**support; electrode** structure for polymer electrolyte **fuel cells**)
RN 7440-44-0 HCAPLUS
CN Carbon (CA INDEX NAME)

c

L33 ANSWER 6 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:118612 HCAPLUS Full-text
DN 140:166763
TI Ion-conductive **binders** for **fuel cells**, electrode-forming compositions and varnishes, and **fuel cells**
IN Omi, Katsuhiko; Ishikawa, Junichi; Fujiyama, Akiko; Fujii, Shigeharu; Tamai, Masashi
PA Mitsui Chemicals Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 21 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004047244	A	20040212	JP 2002-202337	20020711 <--
PRAI JP 2002-202337		20020711 <--		

AB The **binders** are made of crosslinkable poly(ether ketones) containing protonic acid groups (e.g., SO3H) and C1-20 alkyl-containing aromatic rings. Optionally, the **binders** contain strongly acidic group-containing fluoropolymers. The electrode-forming compns. comprise the **binders** and electrode materials. The varnishes comprise the **binders** or the above compns. and solvents. **Fuel cell** electrodes obtained by using the **binders**, the compns., or the varnishes are also claimed. The claimed **fuel cells** have the electrodes formed as above. The **binders** have high ion conductivity, resistance to heat and water, and adhesion to protonic acid-containing aromatic polymer electrolyte membranes and electrode materials.
IC ICM H01M004-86
ICS C08G065-40; C08L027-22; C08L071-00; H01B001-06; H01M008-02; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST polyether polyketone ion conductive **binder fuel cell** electrode
IT Fluoropolymers, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(acidic group-containing, **binders** containing; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)
IT **Carbon** black, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(**electrode** component; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, Nafion, **binders** containing; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT Polyketones
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, sulfo-containing; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT **Binders**
Fuel cell electrodes
Fuel cells
Ionic conductors
Varnishes
(polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT Polyethers, uses
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, sulfo-containing; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT Fluoropolymers, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, Nafion, **binders** containing; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT Ionomers
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, Nafion, **binders** containing; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT **7440-44-0**, Activated **carbon**, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(activated, **electrode** component; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-92-1, Lead, uses 7439-96-5, Manganese, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-33-7, Tungsten, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-55-3, Gallium, uses 7440-62-2, Vanadium, uses 344427-00-5, TEC 10V30E 606942-56-7, TEC 61V33
RL: CAT (Catalyst use); DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(electrode component; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(electrode component; polyether-polyketone ion-conductive **binders** for **fuel cell** electrode formation)

IT **515144-24-8DP**, proton-exchanged
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketone ion-conductive **binders** for **fuel**

cell electrode formation)

IT 655245-35-5P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(polyether-polyketone ion-conductive **binders** for **fuel** **cell** electrode formation)

IT 345-92-6, 4,4'-Difluorobenzophenone 8014-95-7, Fuming sulfuric acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(polyether-polyketone ion-conductive **binders** for **fuel** **cell** electrode formation)

IT 67-56-1, Methanol, uses 109-99-9, Tetrahydrofuran, uses 616-38-6, Dimethyl carbonate 7732-18-5, Water, uses 62309-51-7, Propanol
RL: NUU (Other use, unclassified); USES (Uses)
(varnish containing **binders** and; polyether-polyketone ion-conductive **binders** for **fuel** **cell** electrode formation)

IT **7440-44-0**, Activated **carbon**, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(activated, **electrode** component; polyether-polyketone ion-conductive **binders** for **fuel** **cell** electrode formation)

RN 7440-44-0 HCAPLUS
CN Carbon (CA INDEX NAME)

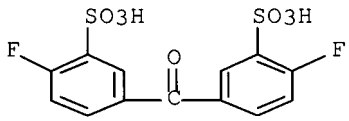
c

IT **515144-24-8DP**, proton-exchanged
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketone ion-conductive **binders** for **fuel** **cell** electrode formation)

RN 515144-24-8 HCAPLUS
CN Benzenesulfonic acid, 3,3'-carbonylbis[6-fluoro-, disodium salt, polymer with bis(4-fluorophenyl)methanone and 4,4'-(1-methylethylidene)bis[2,6-dimethylphenol] (9CI) (CA INDEX NAME)

CM 1

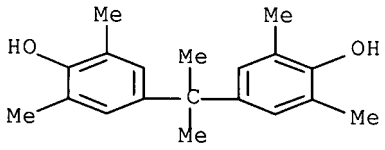
CRN 210531-45-6
CMF C13 H8 F2 O7 S2 . 2 Na



●2 Na

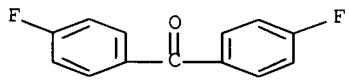
CM 2

CRN 5613-46-7
CMF C19 H24 O2



CM 3

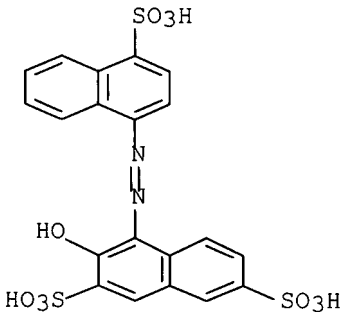
CRN 345-92-6
CMF C13 H8 F2 O



L33 ANSWER 7 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
AN 1998:775646 HCAPLUS Full-text
DN 130:56485
TI Electrochemical decomposition treatment of dye-containing colored water by use of solid polymer electrolyte membrane
AU Yamane, Masataka; Murakami, Yukio; Wakida, Shin-Ichi; Takeda, Sahori; Siroma, Zyun; Higashi, Kunishige; Takenaka, Hiroyasu
CS Department of Energy and the Environment, Osaka National Research Institute, Agency of Industrial Science and Technology, Ministry of International Trade and Industry, Osaka, 563, Japan
SO Proceedings - Japanese-German Workshop on Waste Water and Sludge Treatment, 7th, Kyoto, Dec. 11-12, 1997 (**1998**), Meeting Date 1997, 341-349 Publisher: Public Works Research Institute, Water Quality Control Dep., Tsukuba, Japan.
CODEN: 66YKAU
DT Conference
LA English
AB A novel electrolytic wastewater treatment method using solid polymer electrolyte (SPE) was developed and used to treat dyestuffs. A NafionR (Du Pont) membrane was used as the SPE and βPbO2 was chosen for an anode material which can oxidize organic substances. Within 60-120 min, dyestuffs treated by SPE electrolysis (amaranth, alizarin green G, gallocyanine) were decolorized, showing no detectable color to the naked eye. Organic component removal at 120 min was 74-58% (as COD) and 49-21% (as total organic C) for these dyestuffs. As decomposition products, several organic acids were detected in the treated water.
CC 60-3 (Waste Treatment and Disposal)
Section cross-reference(s): 41, 72
ST electrolytic wastewater treatment dye effluent; solid polymer electrolyte dye wastewater treatment; decolorization wastewater treatment electrolytic; Nafion membrane electrolytic wastewater treatment; lead oxide anode org compd oxidn; decompn product electrolytic treatment dye effluent

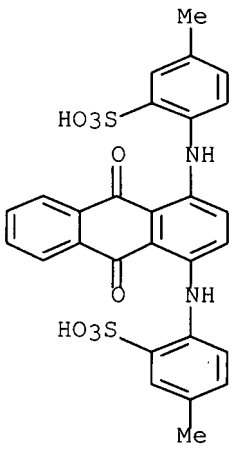
IT Solid electrolytes
(Nafion membrane; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Chemical oxygen demand
Dyes
(c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Sulfates, processes
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Organic compounds, processes
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Wastewater treatment
(decolorization; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Wastewater treatment
(electrochem.; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, solid polymer electrolyte membrane; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(fluorine-containing, sulfo-containing, ionomers, solid polymer electrolyte membrane; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Anodes
(lead oxide; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Acids, processes
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(organic; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Wastewater treatment
Wastewater treatment
(oxidation, electrochem.; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Fluoropolymers, uses
Fluoropolymers, uses
RL: DEV (Device component use); TEM (Technical or engineered material

use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, solid polymer electrolyte membrane; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT Ionomers
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, solid polymer electrolyte membrane; c.d. effect on electrochem. oxidation of dye-containing
effluent using Nafion solid polymer electrolyte membrane and lead oxide anode)
IT 64-18-6, Formic acid, processes 64-19-7, Acetic acid, processes 144-62-7, Oxalic acid, processes
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion
solid polymer electrolyte membrane and lead oxide anode)
IT **915-67-3**, Amaranth 1562-85-2, Gallocyanine **4403-90-1**, Acid green 25
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion
solid **polymer electrolyte** membrane and lead oxide anode)
IT 7440-44-0, Carbon, processes
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(organic; c.d. effect on electrochem. oxidation of dye-containing effluent using
Nafion solid polymer electrolyte membrane and lead oxide anode)
IT 1309-60-0, Lead oxide
RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
(titanium-**supported** anode; c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion solid polymer
electrolyte membrane and lead oxide anode)
IT **915-67-3**, Amaranth **4403-90-1**, Acid green 25
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(c.d. effect on electrochem. oxidation of dye-containing effluent using Nafion
solid **polymer electrolyte** membrane and lead oxide anode)
RN 915-67-3 HCAPLUS
CN 2,7-Naphthalenedisulfonic acid, 3-hydroxy-4-[2-(4-sulfo-1-naphthalenyl)diazenyl]-, sodium salt (1:3) (CA INDEX NAME)



●3 Na

RN 4403-90-1 HCAPLUS
CN Benzenesulfonic acid, 2,2'-[(9,10-dihydro-9,10-dioxo-1,4-anthracenediyl)diimino]bis[5-methyl-, sodium salt (1:2) (CA INDEX NAME)



●2 Na

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

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